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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/339,506	06/24/1999	MATTHEW E. HANSEN	SUL-4034	2715
26111	7590	07/08/2004	EXAMINER	
STERNE, KESSLER, GOLDSTEIN & FOX PLLC 1100 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			LEE, HWA S	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 07/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/339,506	<b>Applicant(s)</b> HANSEN, MATTHEW E.	
	<b>Examiner</b> Andrew H. Lee	<b>Art Unit</b> 2877	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 May 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-10 is/are allowed.
- 6) ☒ Claim(s) 11-14, 16-18, 21-25, 27 and 28 is/are rejected.
- 7) ☐ Claim(s) 15, 19, 20 and 26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/5/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

1. **Claims 11-14, 16-18, 25, and 27** are rejected under 35 U.S.C. 102(e) as being anticipated by Kataoka et al (US 5,814,425 cited by Applicant in IDS of 5/5/04).

For **claims 11 and 27**, Kataoka et al (Kataoka hereinafter) show a method of measuring aberration of a projection optical system comprising:

illuminating (215) periodic patterns (Figures 4 and 5) in an object (W) plane of the optical system;

imaging (for instance column 5, lines 22+) the periodic patterns via the optical system (for instance column 5 lines 19+);

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intercepting and recording the image of the periodic patterns in an image volume (column 4, line 51 to column 5, line 11 and column 5 lines 23+) of the optical system; and

analyzing (108) a recorded image of the periodic patterns formed within the image volume,

whereby optical system parameters are extracted.

With regards to **claims 12-14**, please see column 7, line 61.

With regards to **claim 16**, please see column 5, lines 25+.

With regards to **claim 17**, please see column 7, lines 42+.

With regards to **claim 18**, please see column 8, lines 2+.

With regards to **claim 25**, the act of analyzing calculates the best focus position (column 7, line 19).

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 21 and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka as applied to claim 11 above, and further in view of Kirk et al (“Application of blazed gratings.....” cited in Applicant’s IDS of 5/5/04).

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Kataoka shows all the claimed steps except for the use of a dark field microscope for examining the recorded image.

Kirk et al show the use of a white light dark field microscope for examining a recorded image in determining aberrations in an optical system.

At the time of the invention, one of ordinary skill in the art would have been motivated to use a white light dark field microscope in order to examine the recorded image with high accuracy.

4. **Claims 23 and 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka as applied to claims 11 and 27 respectively above, and further in view of Sawartari et al (US 5,923,423).

Kataoka shows all the claimed steps except for the use of a laser microscope interferometer.

Sawartari et al show a laser microscope interferometer.

At the time of the invention, one of ordinary skill in the art would have used a laser microscope interferometer in order to examine the recorded image with high accuracy because Sawartari et al teach that the laser microscope interferometer has a high accuracy to 0.1 nm.

5. **Claim 24** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka as applied to claim 11 above, and further in view of Biegen (US 4,732,483).

Kataoka shows all the claimed steps except for the use of an interferometer with a large aperture.

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Biegen teaches an interferometer having a large aperture.

At the time of the invention, one of ordinary skill in the art would have used the interferometer of Biegen in order to examine the recorded image with high accuracy as taught by Biegen. Furthermore, one of ordinary skill would have deduced that the use of a large aperture would allow the measurement to be performed with a fewer number of measurements if the sample (recorded image) was large and would have also taken just one measurement to measure the whole sample since one of ordinary skill in the art would understand that taking one measurement saves time versus taking several measurements.

***Allowable Subject Matter***

6. **Claims 1-10** are allowed.
7. **Claims 15, 19, 20, and 26** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Papers related to this application may be submitted to Technology Center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the PTO Fax Center located in CP4-4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Center number is 703-872-9306 for regular communications and for After Final communications.

If the Applicant wishes to send a Fax dealing with either a Proposed Amendment or for discussion for a phone interview then the fax should:

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a) Contain either the statement "DRAFT" or "PROPOSED AMENDMENT" on the Fax Cover Sheet; and

b) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Hwa Lee whose telephone number is (571) 272-2419. The examiner can normally be reached on M-Th. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415.

A handwritten signature in black ink, appearing to read 'Andrew Lee', is positioned above the printed name and title.

Andrew Lee  
Patent Examiner  
Art Unit 2877

June 28, 2004/ahl